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ABSTRACT

Theory of mind research focuses on children's understanding of other people's minds, their desires, intentions, and beliefs. Currently, there is much debate as to what is the substrate for children's theory of mind development; socio-cognitive skills, linguistic development, a simulation of one's own mental states, and the maturation of innate brain structures have all been proposed as possibilities. Few studies have looked at the influences of language and culture on the development of theory of mind. This study compared the performance of 3- and 4-year-old Mandarin-Chinese speakers to that of 3- and 4-year-old English speakers on four theory of mind-related tasks: (1) appearance-reality; (2) Level 2 perspective-taking; (3) an unexpected contents false belief task; and (4) an unexpected transfer false belief task. No significant differences were found between the performance of the Chinese and American children. (Author/KB)

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A Comparison of Chinese and English-Speaking Children on a Series of Theory of Mind-Related Tasks

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Theory of mind research focuses on children's understanding of other people's minds, their desires, intentions and beliefs. Currently there is much debate as to what is the substrate for children's theory of mind development; socio-cognitive skills, linguistic development, a simulation of one's own mental states, and the maturation of innate brain structures have all been proposed as possibilities. Few studies have looked at the influences of language and culture on the development of theory of mind. This study compares 3- and 4-year-old Mandarin-Chinese speakers to 3- and 4-year-old English speakers in four theory of mind-related tasks: appearance-reality, Level 2 perspective-taking, and an unexpected contents and unexpected transfer false belief task. No significant differences were found between the performances of the Chinese and American children.

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INTRODUCTION

A number of researchers have argued that language is a major contributor to the development of a mature theory of mind. Some have focused on children's general language skills (Jenkins & Astington, 1996), others on specific elements of syntactic acquisition (de Villiers & Pyers, 1996), and others on the semantics and acquisition of mental state terms (Bartsch & Wellman, 1995; Shatz et al, 1995).

The Chinese language has some interesting differences with regard to the system of mental state verbs in comparison with English. The word *xiang3* (number represents tone) can be translated as "think," and it is commonly used by adults in sentences such as "*Wo3 xiang3 ta1 bu4 zhi1 dao4*." [I don't think she knows.]. It also can be translated as "want," however, and this is the use that children first learn (Tardif & Wellman, 1998). In the natural language data of Mandarin-speaking children at the one- and two word stages, Tardif and Wellman found that Mandarin-speaking children used desire terms earlier than their English-speaking counterparts; however, their use of terms for "thinking" was very infrequent, even for the Mandarin-speaking adults. Mandarin Chinese also has the word, *yi3 wei2,* which is frequently used to mean "I thought incorrectly" as in the sentence, "*Wo3 yi3 wei2 ta1 shim xue2sheng1*." [I thought (incorrectly) he was a student.] These characteristics of mental state language in Chinese are interesting in light of Wellman and Bartsch's (1995) theory that children develop from a desire to a

desire-belief theory of mind and the evidence of Shatz et al (1995) for an effect of the presence of specific false-belief terms in a language system.

Mandarin is also interesting because, unlike English, the complement form for a desire term like "want" can be the same as that for a belief term like "think." For Mandarin speakers, there is not necessarily any increasing syntactic complexity in moving from desire statements to belief statements as there is in English.

There have been few studies of Chinese children's development of theory of mind. Flavell et al (1983) tested 3- to 5-year-old children from the People's Republic of China on the appearance-reality distinction and found that their performance paralleled that of children in the United States. Chen & Lin (1994), however, found that both 3- and 4-year-old children from the People's Republic of China performed badly on false belief tasks. They suggest that cultural differences in child-rearing practices and the focus of traditional children's stories may account for these differences.

METHODS

SUBJECTS

Sixty-four subjects were tested, 16 3-year-old and 16 4-year-old Mandarin Chinese speakers from Beijing, People's Republic of China, and 16 3-year-old and 16 4-year-old English speakers from Ann Arbor, MI. Children were matched according to the education level of the primary wage earner, and all children were tested in university daycares.

PROCEDURE

Each child was given the following testing measures, with the second forms of the test given a week after the first forms:

1. Two forms of an appearance-reality task

Deceptive objects: rock-sponge and fish-pen

Appearance test question : **"What does this look like? does it look like a rock or does it look like a sponge?"**

Reality test question: **"What is this really? Is it really a rock or is it really a sponge?"**

2. Two forms of a level 2 perception-taking task

Materials: Turtle picture, elephant picture

Child's perspective: **"When you look at the turtle right now, does it look like it's standing on its feet or lying on its back?"**

Test question: **"When I look at the turtle right now, does it look like it's standing on its feet or lying on its back?"**

3. Two forms of the unexpected contents false belief task

Materials: M&M's box with car, crayon box with chocolate

Test false belief question: **"X hasn't seen inside this box. What will he/she think is inside before he/she opens it? Will she think there is candy inside or crayons inside?"**

4. Two forms of the "Sally-Anne" unexpected transfer false belief task.

Materials: dolls and toy drawers, dolls and toy pails

Test false belief question: **"Where will Yang-yang look first for the chocolate? Will he look in the red drawer or the blue drawer?"**

RESULTS

Children were given a "theory of mind" score (scale 0-4) based on whether they passed the above tasks. A 2(age) by 2(language) by 2(form/order) repeated-measures ANOVA was performed with age and

language as between-subjects factors and form/order as a within-subjects factor. A main effect for age was found, with 4-year-olds doing significantly better than 3-year-olds, $F(1, 31)=38.46$, $p < .001$. There was also a significant difference between the children's performance at the first testing time (TOM1) and the second testing time (TOM2), $F(1,31)=15.29$, $p < .001$ with the children performing better at the second testing. There was no overall effect of language on the children's performance on these tasks and no significant interactions.

Table 1

Mandarin Chinese and English speakers' mean TOM scores (and standard deviations).

	Mandarin Speakers		English Speakers	
	TOM1	TOM2	TOM1	TOM2
3-year-olds	0.88 (.806)	1.06 (.854)	1.13 (1.025)	1.44 (1.031)
4-year-olds	2.25 (.931)	3.0 (.817)	2.38 (1.408)	2.69 (1.138)

The means and standard deviations for the four individual theory of mind-related tasks (appearance-reality, level 2 perspective-taking, unexpected contents false belief, and unexpected transfer false belief) combined over the two testing sessions are presented in Table 2 for both language groups. A 2(age group) by 2(language) general factorial analysis of variance was performed for each individual theory of mind-related task with age and language as fixed factors and the individual task scores as the

dependent factor. A main effect of age group was found for each of the individual tasks; for ARtot, $F(1, 31)=5.12$, $p < .05$; for PTtot, $F=7.13$, $p = .01$; for FBbtot, $F=18.44$, $p < .001$; for FBstot, $F=31.64$, $p < .001$ with 4-year-olds performing significantly better than 3-year-olds for each task. There was no effect for language and no significant interaction in any of the individual tasks.

Table 2

Mandarin Chinese and English speakers' mean scores and standard deviations on the individual TOM tasks combined over the two testing sessions

	Combined Score over both Forms/Testing Sessions	
	Chinese speakers	English speakers
Appearance-Reality		
3-year-olds	.875 (.806)	1.0 (.966)
4-year-olds	1.5 (.73)	1.31 (.793)
Perspective-Taking		
3-year-olds	.625 (.806)	.813 (.75)
4-year-olds	1.31 (.873)	1.25 (.931)
False-Belief (Contents)		
3-year-olds	.25 (.577)	.188 (.403)
4-year-olds	1.0 (.894)	1.06 (.998)
False-belief (Transfer)		
3-year-olds	.188 (.403)	.563 (.814)
4-year-olds	1.44 (.814)	1.44 (.892)

CONCLUSIONS

Overall there seems to be no effect of the linguistic and cultural differences between Mandarin- and English-speakers on the children's performance. Both Chinese and English children showed similar patterns of development between the ages of 3 and 4. The lack of a more complicated syntax for mental verbs, less talk about "thinking," and different child-rearing practices seem to have no clear effect on Chinese children's acquisition of theory of mind skills.

REFERENCES

Bartsch, K. & Wellman, H. (1995). *Children talk about the mind.* Oxford: Oxford University Press.

Chen M.J. & Lin, Z.X. (1994). Chinese preschoolers' difficulty with theory-of-mind tests. *Bulletin of the Hong Kong Psychological Society, 32/33,* 34-46.

de Villiers, J. & Pyers, J. (1996, November). *Complementing cognition: The relationship between language and theory of mind.* Poster session presented at the Boston University Conference on Language Development.

Flavell, J. H., Zhang, X.D., Zou, H., Dong, Q., & Qi, S. (1983). A comparison between the development of the appearance-reality distinction in the People's Republic of China and the United States. *Cognitive Psychology, 15,* 459-466.

Jenkins, J. M. & Astington, J. W. (1996). Cognitive factors and family structure associated with theory of mind development in young children. *Developmental Psychology, 32,* 70-78.

Shatz, M., Martinez, I., Diesendruck, G., & Akar, D. (1995). *The influence of language on children's understanding of false belief.* Paper presented at the Society for Research in Child Development.

Tardif, T. & Wellman, H. (June, 1998). *Acquisition of mental state language in Mandarin- and Cantonese- speaking children.* Paper presented at the Jean Piaget Society Meeting, Chicago.